

Week 05

Lab 06 - Bitwise operators

1. What is the output of the following program?

```
int a = 4, b = 3;
a = a ^ b;
b = a ^ b;
a = a ^ b;
printf("After XOR, a = %d and b = %d\n", a, b);
```

2. Write a function `leftShift(x,n)` that returns the value of the integer `x` shifted to the left by `n` positions.

3. What is the result of the following statements given `x = 5`, `y = 3`;

- a. `x & y`
- b. `x | y`
- c. `x ^ y`
- d. `x && y`
- e. `x << y`
- f. `x >> y`

4. Consider the function, what value does the function return in the following function calls? Work out the problem by hand and **show your work**. You may run the function to check your answer.

```
unsigned getbits(unsigned x, int p, int n)
{
    return (x >> (p+1-n)) & ~(~0 << n);
}
```

- a. `getbits(5, 3, 3);`
- b. `getbits(5, 4, 3);`
- c. `getbits(24, 1, 3);`
- d. `getbits(28, 1, 3);`